University of Bahrain
College of Information Technology
Department of Computer Engineering

ITCE 250 section
Model Solution.
Name:----------
I.D.:----------
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Time duration: 20 minutes

Quiz (9)

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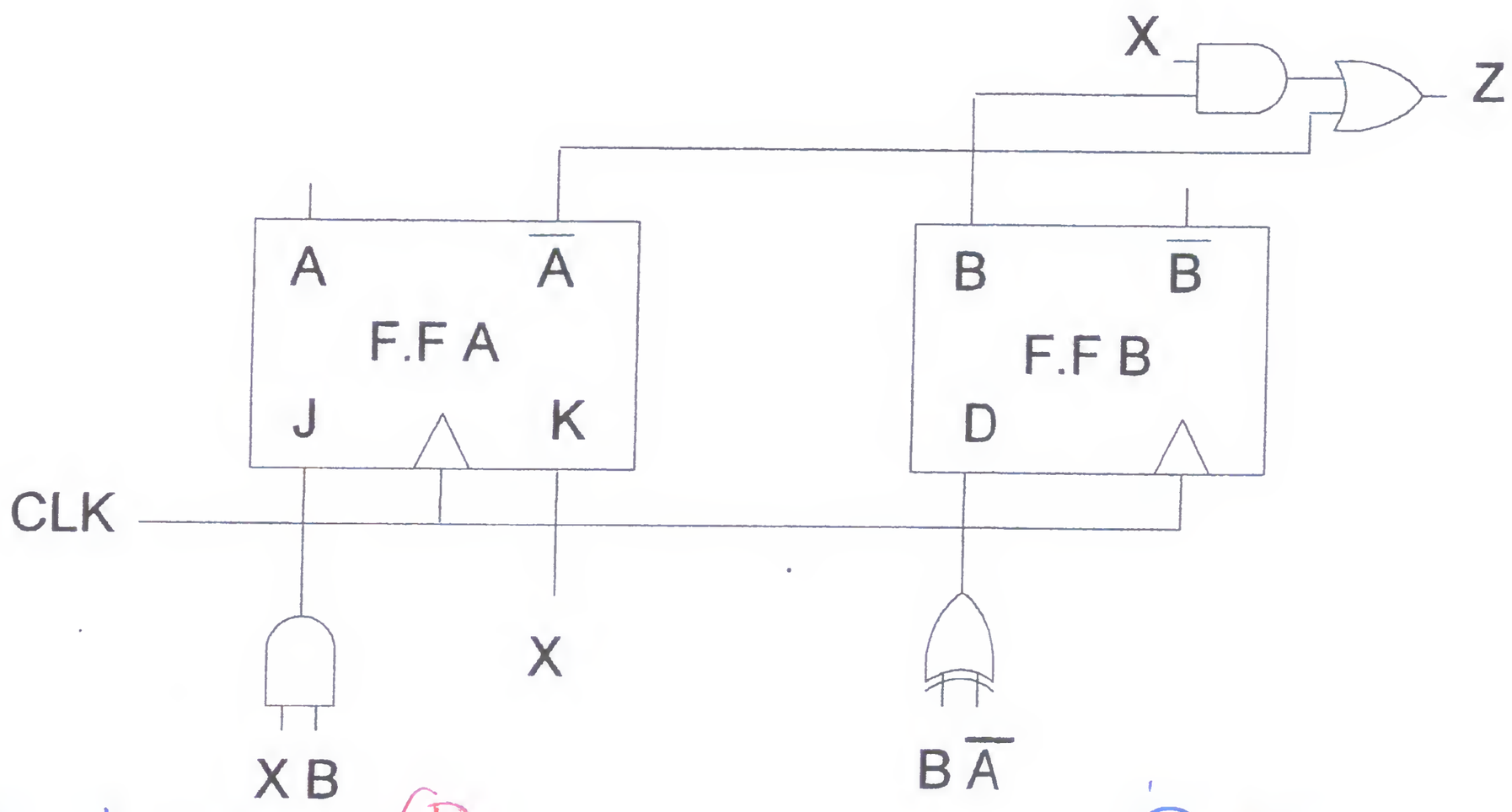
A sequential network is made using two flip-flops **A** & **B**, having one input **X** and one output **Z**.

a. Is this a Moore or Mealy circuit, justify your answer? Mealy, because $Z = f(x)$ (1)

b. Analyze the following sequential circuit by state diagram (show all steps and work necessary to the state diagram including the input and output equations, next-state equations for the flip flops, k-maps, state tables and finally state graph).

c. Starting from S_3=11, what is the output sequence when the input sequence is X= 011011. Indicate the next states after each change in X.



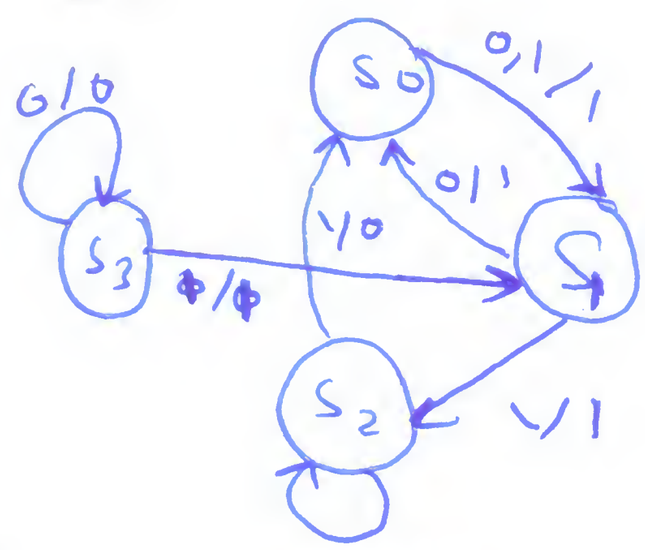
$J_A = XB \quad K_A = X$ (1)

$\therefore A^+ = J_A A' + K_A' A$

$= XBA' + X'A$ (1)

$B^+ = D_B = A \oplus B = A'B' + AB$ (1)

$Z = XB + A'$ (1)



AB	A^+B^+		Z	
	X=0	X=1	X=0	X=1
S_0 00	S_1 01	S_1 01	1	1
S_1 01	S_0 00	S_2 10	1	1
S_2 10	S_2 10	S_0 00	0	0
S_3 11	S_3 11	S_1 01	0	1

(2)

(S_3)

S =	S_3	S_1	S_2	S_2	S_0	S_1
X =	0	1	1	0	1	1
Z =	0	1	1	0	0	1

(2)